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<b>(54) Title:</b> TELECOMMUNICATION TRANSMISSION SYSTEM ADAPTED FOR AN ELECTRONIC MARKET PLACE		
<b>(57) Abstract</b> <p>The invention provides a telecommunications transmission system adapted to operate as a platform for an agent-based electronic market. The platform is arranged to support agent-based market interactions between a plurality of agent types. The system includes a plurality of end user terminals arranged for connection to the Internet, at least one service provider server, a plurality of electronic shops and means for automatically creating and managing product categories/attributes for the electronic market place and facilitating self regulation of the system.</p>		

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## TELECOMMUNICATION TRANSMISSION SYSTEM ADAPTED FOR AN ELECTRONIC MARKET PLACE

5 The invention relates to a telecommunications transmission system adapted to provide a platform for electronic market place services, in particular agent orientated electronic market place services, such as, the Agent-based Market Place (AMP) services offered by Telia, and a method of operating said telecommunications transmission system.

10 The present invention is directed to, among other things, methods of operating the physical infrastructure associated with a telecommunications transmission platform used to support the provision of telecommunications based services. It is necessary to draw a clear distinction between the operation of an electronic market place, which may be modelled on real world market places, and the telecommunications infrastructure  
15 used to provide a platform on which the electronic market place operates. It must be recognized that the methods of commerce used on, for example the Internet, and methods of operating the technical elements of the Internet are distinct.

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20 Internet use has dramatically increased. Many people now have access to the Internet, not only from their offices but also from their homes. Through the development and deployment of secure identification systems, electronic payment systems etc., electronic commerce, e-commerce, on the Internet is becoming an acceptable way of conducting business safely and securely.

25 It is considered by many market research organizations that electronic commerce will be one of the fastest growing areas on the Internet because it not only gives an Internet user a more convenient and time-saving shopping experience, but it also enables merchants, trading on the Internet, to save money through use of more cost-efficient operations including, inter alia, business process re-engineering at the  
30 enterprise level increasing competitiveness through lower prices and the ability to introduce one-to-one marketing techniques.

Many companies have realized the impact and possibilities that agent orientated

services will have on e-commerce on the Internet, both today and in the future. For example, Netscape has announced that agent-based search engines will be introduced in coming releases, and Jango already uses a search engine for commercial information based on agent orientation. In addition, Firefly and NetPerception have introduced Recommendation Engines which are being used by Amazon.com and other commercially successful web sites. There are also companies, such as Kinetoscope, that offer tools for developing agent-oriented services for the Internet.

The services provided by an agent orientated electronic market place, such as AMP, include, inter alia, a number of services that:

makes it easier for users to take advantage of the offered services;

- create new opportunities for real time and relationship marketing for merchants (sellers of the offered services), and
- create valuable opportunities for a network operator to sell individual advertisements and statistics.

These services are, in essence, based on buy/sell interests which are specified by the sellers (merchants) and buyers (users) using the electronic market place.

In order to successfully operate an agent orientated market place, such as AMP, it is necessary to make it extremely easy for users to specify their buy/sell interests. It is impossible for a system operator to manually specify all possible product categories and the valid attributes for each product category. Even if a large amount of initial work is done to keep the system up to date, it will still be necessary to create and delete product categories and attributes, over time, due to the fact that new products are entering the market and old products are becoming obsolete.

The solution, according to the present invention, is the provision of a self-regulating system that makes it possible for users to create and delete product categories and attributes when needed. Furthermore, in order to provide an efficient

and user friendly system, it is necessary for the telecommunications transmission system of the present invention to automatically adapt the product categories and attributes to limit the number of product categories and the number of attributes/product categories to a manageable size for users of the electronic market place; and

- automatically remove rarely used product categories and/or attributes; and

replace the rarely used product categories and/or attributes with the more popular product categories and attributes;

and to thereby provide to a dynamic adaptation of the categories/attributes that are mostly requested by system users.

It is an object of the present invention to provide a telecommunications transmission system and method adapted to automatically create and manage product categories for agent orientated electronic market place services, such as, the AMP services offered by Telia.

According to a first aspect of the present invention, there is provided, a telecommunications transmission system adapted to operate as a platform for an agent-based electronic market and including a plurality of end user terminals arranged for connection to the Internet, at least one service provider server, and a plurality of electronic shops, said platform being arranged to support agent-based market interactions between a plurality of agent types, characterised in that said system includes means for automatically creating and managing product categories/attributes for said electronic market place and facilitating self regulation of the system.

The services provided by said agent-based electronic market place may include, inter alia, WebButler, AgentFind and MerchantAssist services, based on buy/sell interests specified by buyers and merchants. The WebButler and said MerchantAssist services may be adapted to carry specifications of interest in trade terms, and the AgentFind service may be adapted, in response to receipt of a specification for a buy/sell

interest, to identify a WebButler, or Web-store, having a specification for a corresponding interest.

The WebButler service may include means for generating scroll-bar menus containing information relating to categories and attributes of products that are available for purchase, or sale, via said agent-based electronic market place. The end user terminals preferably include a computer having a display screen and software for accessing the Internet and said agent-based electronic market place, and the scroll-bars are adapted to be displayed on the display screen of said user's computer.

The WebButler may be adapted to provide the following scroll-bar menus: Product Category, Buy/Sell, New or Used, Age, Price, and Type of Product selected from a "Product Category" menu.

The telecommunications transmission system may be adapted to employ user-specified interests; match buyer/seller interests; and provide a self-converging functionality that enables system users to generate information for scroll-bar menus, and system operators to ensure that product categories displayed on said scroll-bar menus are the most frequently used/valuable categories.

The telecommunications transmission system may be adapted to display, on the screen of a user's computer, scroll-bar menus for product categories/attributes; together with an "Other Requirements" window, adapted to enable said user to specify product attributes, not included in said scroll-bar menus.

The self regulation may be adapted to enable a user to create and delete product categories; and to facilitate dynamic regulation of the form and content of said scroll-bar menus by limiting said scroll-bar menus to a predefined number of product categories and product attributes; automatically and selectively removing, from said scroll-bar menus, those product categories and/or attributes that are least used; and automatically replacing the removed product categories/attributes with other product categories/attributes.

The telecommunications transmission system may be adapted to provide a user friendly and relatively easy to manage scroll-bar interface by limiting the number of product categories and product attributes to about 20 to 30 items per scroll-bar menu.

5 The telecommunications transmission system may be adapted to automatically generate, over a predetermined period of time, statistical information concerning the frequency of use of each product category and the related attributes and to thereby determine the most frequently used product categories/attributes.

10 The telecommunications transmission system may be adapted to automatically transfer rarely used product categories from a respective scroll-bar menu to a search function for 'Other Product Categories', and the search function may be adapted to find product categories not displayed on said scroll-bar menus. The search function for 'Other Product Categories' may be adapted to be displayed on said user's computer  
15 screen, and the display may include an 'Other Product Category' window including a 'Find' icon and a 'Specify New' icon, each icon being adapted for selection by a system user; and a further window including a search icon, and a legend requesting said user to write the name of a required product category in a space provided in said further window, said search icon being adapted for selection by said user after entering said  
20 product category name in the provided space. In the event of an unsuccessful search with said search function for 'Other Product Categories', the system may be adapted to enable a new product category and product attributes to be defined by a user, and to automatically specify, for said new product category, attributes that are mandated by said system. The attributes mandated by said system are 'Buy/Sell', 'New or Used',  
25 'Age', 'Price', and 'Location'.

The telecommunications transmission system may be adapted to display attributes from an information topology of said system, that could be inherited by said new product category; enable said user to select any one, or more, of the displayed  
30 attributes for the new product category; and enable selected attributes to be displayed, as a default function, beside an already presented functionality for specifying new types of attributes.

The telecommunications transmission system may include notification means for notifying the system operator when a new product category, or product attributes, are defined. The system may be adapted to effect automatic removal of, or prevent entry of, illegal and/or unethical product categories/attributes; store removed product categories/attributes on a 'black list'; automatically check newly defined product categories, notified by said notification means, with said black list; and automatically reject new product categories/attributes found on said black list.

The telecommunications transmission system may include means for automatically removing duplicate product categories.

The telecommunications transmission system may include means for automatically generating scroll-bar menus for a new product category and to make said new product category available in said 'Other Product Category' through use of said search function.

The telecommunications transmission system may be adapted to enable a user to add attributes to an already defined product category; automatically limit the number of attributes for a product category to a pre-defined limit; and ensure that any attributes, in excess of the predefined limit, are made available through either a search function, or by an expansion function for displaying the attributes in at least one further set.

The telecommunications transmission system may include an algorithm adapted to select product categories/attributes and to calculate which categories are retained on a product category scroll-bar list; moved to the search function for 'Other Product Category'; or moved from 'Other Product Category' to a product category scroll-bar menu. The algorithm may be adapted to continuously calculate and generate statistical information concerning usage for each product category/attribute, the time interval at which said statistical information is calculated and said product categories are restructured, using said statistical information; being set by an operator of said system. The default value for said time interval may be one week.

The telecommunications transmission system may include means for



automatically transferring a predefined percentage of product categories from a scroll-bar menu to 'Other Product Categories', at predetermined time intervals, and for replacing the transferred product categories with product categories from said 'Other Product Categories'.

5 The predefined time limit may be every 7 to 10 days.

According to a second aspect of the present invention, there is provided, in a telecommunications transmission system adapted to operate as a platform for an agent-based electronic market and including a plurality of end user terminals arranged for  
10 connection to the Internet, at least one service provider server, and a plurality of electronic shops, said platform being arranged to support agent-based market interactions between a plurality of agent types, a method of operating the telecommunications transmission system characterised by automatically creating and  
15 managing product categories/attributes for said electronic market place and facilitating self regulation of the system.

The method may be characterised by said agent-based electronic market place providing a number of services include, inter alia, WebButler, AgentFind and  
20 MerchantAssist services, based on buy/sell interests specified by buyers and merchants, by said WebButler and said MerchantAssist services carrying specifications of interest in trade terms, and by said AgentFind service, in response to receipt of a specification for a buy/sell interest, identifying a WebButler, or Web-store, having a specification for a corresponding interest. The method may be further characterised by said WebButler  
25 service providing scroll-bar menus containing information relating to categories and attributes of products that are available for purchase, or sale, via said agent-based electronic market place, by said end user terminals including a computer having a display screen and software for accessing the Internet and said agent-based electronic market place, and by said scroll-bars being displayed on the display screen of said  
30 user's computer. The method may be further characterised by said WebButler providing the following scroll-bar menus: Product Category, Buy/Sell, New or Used, Age, Price, and Type of Product selected from a 'Product Category' menu.

The method may be characterised by the steps of employing user-specified interests; matching buyer/seller interests; and providing a self-converging functionality that enables system users to generate information for scroll-bar menus, and system operators to ensure that product categories displayed on said scroll-bar menus are the most frequently used/valuable categories.

The method may be characterised by the steps of displaying, on the screen of a user's computer, scroll-bar menus for product categories/attributes, together with an 'Other Requirements' window; said user using said scroll-bar menus to specify product attributes, not included in said scroll-bar menus.

The method may be characterised by said self regulating system enabling a user to create and delete product categories.

The method may be characterised by said self regulated system facilitating dynamic regulation of the form and content of said scroll-bar menus by limiting said scroll-bar menus to a predefined number of product categories and product attributes; automatically and selectively removing, from said scroll-bar menus, those product categories and/or attributes that are least used; and automatically replacing the removed product categories/attributes with other product categories/attributes.

The method may be characterised by limiting the number of product categories and product attributes to about 20 to 30 items per scroll-bar menu to facilitate the provision of a user friendly and relatively easy to manage scroll-bar interface for said system. The method may be further characterised by automatically generate, over a predetermined period of time, statistical information concerning the frequency of use of each product category and the related attributes, and by determining the most frequently used product categories/attributes. The method may be further characterised by automatically transferring rarely used product categories from a respective scroll-bar menu to a search function for 'Other Product Categories', and by using said search function to find product categories not displayed on said scroll-bar menus.

The method may be characterised by the steps of displaying said search function

for 'Other Product Categories' on said user's computer screen, said display including an 'Other Product Category' window having a 'Find' icon and a 'Specify New' icon associated therewith, a further window having a search icon associated therewith, and a legend requesting said user to write the name of a required product category in a space provided in said further window; a system user initiating a search for a product category not displayed on said scroll-bar menus by clicking said 'Find' icon, writing the name of the required product in the space provided for that purpose, and clicking said search icon; and a system user defining a new product category by clicking said 'Specify New' icon to reveal further windows for specifying the name and attributes of the new product.

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The method may be characterised by the steps of said system user, in the event of an unsuccessful search with said search function for 'Other Product Categories', defining a new product category and product attributes; and said system automatically specifying, for said new product category, attributes that are mandated by the system.

15 The method may be further characterised in that the attributes mandated by said system are 'Buy/Sell', 'New or Used', 'Age', 'Price', and 'Location'.

The method may be characterised by the steps of said system displaying attributes from an information topology thereof, that could be inherited by said new product category; said user selecting any one or more of the displayed attributes for the new product category; and displaying selected attributes for said new product category, as a default function, beside an already presented functionality for specifying new types of attributes.

20 The method may be characterised by notifying the system operator when a new product category, or product attributes, are defined. The method may be further characterised by the steps of effecting automatic removal of, or preventing entry of, illegal, and/or unethical product categories/attributes; storing removed product categories/attributes on a 'black list'; automatically checking newly defined product categories, notified to said system operator, with said black list; and automatically rejecting new product categories/attributes found on said black list.

25 The method may be characterised by the step of automatically removing

duplicate product categories; and making said new product category

The method may be characterised by the steps of automatically generating  
scroll-bar menus for a new product category; and making said new product category  
5 available in said 'Other Product Category' through use of said search function.

The method may be characterised by the steps of enabling a user to add  
attributes to an already defined product category; automatically limiting the number of  
attributes for a product category to a pre-defined limit; and ensuring that any attributes,  
10 in excess of the predefined limit, are made available through either a search function, or  
by an expansion function for displaying the attributes in at least one further set.

The method may be characterised by the step of using an algorithm for selecting  
product categories/attributes, and calculating which categories are retained on a product  
category scroll-bar list; moved to the search function for 'Other Product Category'; or  
15 moved from 'Other Product Category' to a product category scroll-bar menu.

The method may be characterised by the steps of using said algorithm to  
continuously calculate and generate statistical information concerning usage for each  
product category/attribute; and an operator of said system setting the time interval at  
20 which said statistical information is calculated, and said product categories are  
restructured using said statistical information. The method may be further characterised  
in that a default value for said time interval is one week.

25 The method may be characterised by the steps of automatically transferring a  
predefined percentage of product categories from a scroll-bar menu to 'Other Product  
Categories', at predetermined time intervals; and replacing the transferred product  
categories with product categories from said 'Other Product Categories'.

30 The method may be characterised in that said predefined time limit is every 7 to  
10 days.

The foregoing and other features of the present invention will be better

understood from the following description with reference to the accompanying drawings, in which:

Figure 1 diagrammatically illustrates, in the form of a block diagram, a high-level overview of the relationships between some basic functions/products related to an Agent-based Electronic Commerce Platform and Services;

Figure 2 diagrammatically illustrates, in the form of a block diagram, a layered architecture model of an Agent-based Service Platform;

Figure 3 shows message/event types for an Agent-based Auctioneer Service;

Figure 4 diagrammatically illustrates, in the form of a block diagram, a general layered architecture for a translation agent that translates between different agent protocols, or from/to traditional http-based web sites;

Figure 5 diagrammatically illustrates, in the form of a block diagram, a User Client Computer and a Merchant's Commercial Web Server and the manner in which a user can monitor and control his/her personal agent through a separate Telia WebButler Graphic User Interface;

Figure 6 diagrammatically illustrates, in the form of a block diagram, the different software modules in the Telia WebButler;

Figure 7 shows a scroll-bar specification of buy/sell interests;

Figure 8 shows a scroll-bar type search function for product categories not covered by the scroll-bar specifications of Figure 7;

Figure 9 shows one example of the use of a product category found by the search function of Figure 8; and

Figure 10 shows a scroll-bar arrangement for a new product category defined by

and nodes a user of the electronic market place. The system is arranged to support a plurality of user terminals arranged for connection to the Internet, at least one service provider server, and a plurality of electronic shops. The platform is arranged to support agent-based market interactions between a plurality of agent types, and the telecommunications transmission system includes means for automatically creating and managing product categories/attributes for the electronic market place and facilitate self regulation of the system.

As stated above, many companies have realized the impact and possibilities that agent orientated services will have on e-commerce on the Internet, both today and in the future. It will be seen from the subsequent description that the telecommunications transmission system of the present invention is adapted to operate as a platform for an agent-based electronic market, and includes a plurality of user terminals arranged for connection to the Internet, at least one service provider server, and a plurality of electronic shops. The platform is arranged to support agent-based market interactions between a plurality of agent types, and the telecommunications transmission system includes means for automatically creating and managing product categories/attributes for the electronic market place and facilitate self regulation of the system.

A high-level overview of the relationships between some basic functions/products related to an Agent-based Electronic Commerce Platform and Services is diagrammatically illustrates in Figure 1 of the accompanying drawings, in the form of a block diagram.

The differences between known products/services, based on agent orientated architectures, and Telia's Agent-based Market Place (AMP), are as follows:

(a) AMP enables peer-to-peer autonomous communication between agents on the Internet. These can be agents representing users wanting to buy and/or sell goods and services, merchants, brokers, etc.. This approach has the advantage that any agent can initiate a communication with other agents, computer programs, at any time. The agents can understand the information they receive and take action autonomously. They can, therefore, fulfill complex requests from their owner. The disadvantage is that additional data has to be created to support machine-to-machine communication because, at the present time, the web is structured to support man-machine and not machine-machine communication.

(b) Since the agents can manage the interest descriptions of their owners, it is

possible to achieve more powerful, realtime relationship marketing when the owner visits e-commerce stores on the web. It is also possible for the merchant to develop the relationship with the owner/owners agent after the visit to his/her store.

- 5 (c) Based on its ability to support machine-to-machine communication, AMP makes it possible for users to specify, in a user-friendly manner, trigger-points when the user would like to come into the loop while the agent is working on a task. That could, for example, be when it is necessary to give an offer over a specified limit in a buying negotiation for a requested item.

- 10 (d) Giving the user a useful tool to facilitate obtaining status information about the different tasks the user's agent is working on. This will, of course, also include the capability to:

- 15 if desired, manually take-over control for different tasks from the agent; and

change trigger-points and other important parameters, etc..

- 20 (e) Since the agent is executing on a network operator's servers, for example, Telia's servers in their telecommunications network, the user can access the agent through any device, for example, a home computer, a computer at the user's place of work, a mobile PDA, and may even obtain notifications through pagers, GSM/SMS, etc.. This gives the user the additional benefit that he/she doesn't need to be connected on-line when the agent is working on the requested task while still giving the agent the ability to urgently notify the user, as and when required, through the user's preferred telecommunication service.

- 30 (f) Co-operation between agents, based on different technical platforms, can also be achieved.

(g) Agents can interface services, such as, reputation services, payment services,

logistic services etc..

- (h) Supports e-mail communications which makes it possible to communicate through firewalls. Also creates a more easily used interface to EDI applications.

The forgoing mechanisms open-up new possibilities for electronic commerce in the consumer-to-consumer, the business-to-consumer, as well as, the business-to-business marketplace.

The Agent-based Market Place (AMP) introduces a new paradigm for the Internet which opens up new possibilities for network operators, such as Telia, and their business customers, partners and consumers. In 1996, Telia developed a Market Space prototype, in co-operation with the Swedish Institute of Computer Science (STCS) and the Uppsala University, which implemented basic protocols and mechanisms for an AMP. The technical and commercial opportunities for AMP was successfully demonstrated by using the Market Space prototype in an electronic auction application.

An Agent-based Electronic Commerce Service Platform supports Agent Applications with necessary mechanisms making it fast and easy to implement new types of agent functionality/behaviour for electronic commerce. In order to achieve flexibility, a layered architecture, such as the layered model of an Agent-based Service Platform diagrammatically illustrated, in the form of a block diagram, in Figure 2 of the accompanying drawings can be used. As illustrated in Figure 2, the different layers of the model are as follows:

(1) **Agent Specific Layer:** Where different behaviour/functionality for agent applications are implemented. Typical examples are Telia WebButler, Telia InfoBroker, Telia MerchantAssist, Telia AgentFind, Telia Archive, and Telia Auction.

(2) **Information Layer:** Translation from internal representation to the



Agent Communication Protocol used between Agents. Could, for example, be KQML or something similar.

5 (3) Interaction Layer: Creation/Parsing of messages (see Figure 2).

(4) Message Transfer Layer: Managing the physical Internet transfer of messages utilizing mechanisms like sockets, for example.

10 The Agent-based Market Place (AMP) Service Platform focuses on supporting electronic commerce applications. Figure 3 shows examples of messages managed in the Interaction Layer of Figure 2 for the auctioneer application. Other messages/event types can be created if needed for other applications, such as index service, credit reporting service, etc.

Another important aspect is that not all agents on the Internet will be based on this platform. It is, therefore, necessary to support an application that translates between different agent types. That service is also important when the agent applications access information based on traditional http format. Figure 4 of the accompanying drawings diagrammatically illustrates, in the form of a block diagram, the general layered architecture for this translation agent.

20 A new type of index service, provided by Telia, which has similarities with the search engines on the web is called AgentFind. The role of AgentFind is to inform agents/WebButlers about other agents/WebButlers having corresponding interest profiles, in order to make it possible for those agents to find each other. An important difference between AMPS and HTTP-based search engines is that this database will change much more rapidly. It is, therefore, necessary to implement mechanisms in the ACP (Agent Communication Protocol) that support consistency management between  
30 the AgentFind database and the interests stored at the users WebButlers. Another key issue is the rating mechanism related to the level of conformity between the interest specifications of different WebButlers. This mechanism has, for example, to take into

consideration if specific parameters have been specified as mandatory, or optional.

Duel Session Identification is a mechanism which makes it possible to synchronize a real-time session for a user on a commercial Web-site with the dialogue  
5 between the user's WebButler and the commercial Web-site's corresponding Merchant Assist functionality. This makes it possible to create personalized real-time promotions etc. based on a user's actual interest profile.

Market Integration Agent ACP-HTTP is a mechanism which makes it possible for  
10 WebButler and other agents to utilize ordinary http-based information from conventional web-sites.

Market Integration Agent AMP/ACP to other ACP is a mechanism which makes it possible for agents based on different technical platforms to communicate with each  
15 other.

Agent-based Payment Manager/Adaptor implements the functionality needed for managing payments from autonomous agents. The Payment Manager mechanisms utilize basic payment mechanisms provided by, for example, SEMPER.

Architecture for Agent-based Electronic Commerce Service Platform - this is the technical architecture the AMP services are built upon. It consist of agent specific layer, information layer, interaction layer and the message transfer layer.

25 The Agent-based Market Place (AMP) services are as follows:

(A) Telia WebButler:

- Negotiate and Auction;
- Interest editor for contracts;
- Trigger-point editor and priority;

- **Accessibility and Notification;**
- **Notification Calender;**
- 5 - **Personal profile (address, interest, demography);**
- **Plug-in's for different behaviour missions;**
- **Message Box;**
- 10 - **Advertisement Box;**
- **Bookmarks to other agents;**
- 15 - **Secure identification when accessing the personal WebButler;**
- **Identification during signing of contracts (CA, dig. signature, ...);**
- 20 - **Restriction mechanisms (inherit from parent to child, ...);**
- **Electronic wallet; and**
- **GUI.**

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**(B) Telia InfoBroker:**

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- **Telia AgentFind (index service that links together agents with similar interests);**
- **Telia Archive for signed contracts;**
- **Distribution of personal advertisements;**

**Statistics of requested interests; and**

**Interface to Pay Service.**

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**(C) Telia Merchant Assist:**

**Personal Advertisement Management;**

10 **Relationship advertisement and dynamic WWW-promotion related to individual users unique interests;**

**Loyalty programs;**

15 **Interface to Telia Pay;**

**Interface to Telia Distribute; and**

**Statistics over consumer profiles.**

20

The Telia WebButler Service has a user friendly interface through which the user can interact with agent-based and conventional WWW-based services on the Internet.

The service is used through a separate window on the user's computer (see Figure 5 of the accompanying drawings). This means that the Telia WebButler can co-operate with

25 other services that the user accesses through TCP/IP, for example, through his/her conventional web-browser (Netscape, Explorer, etc.). It is, however, possible for the Telia WebButler to also operate when the owner is disconnected from the network through e-mail EDI messages etc..

30 The benefit of WebButler is that the agent at the user's server and the agent at the visited web-site can communicate interests and transfers basic data between each other. The result is that there is no need for the person concerned to manually type-in requested information at the site. An even larger benefit for the user is that the site

knows about the user's interest. This means that the user will be presented with, for him/her, valuable information directly by the site instead of receiving the standard information that all users receive. This is not only an advantage for the user, since commercial web-sites can use this information for relationship marketing, so that this information is valuable for both parties.

Figure 5 of the accompany drawings diagrammatically illustrates a User Client Computer and a Merchant's Commercial Web Server. The user can monitor and control his/her personal agent through a separate Telia WebButler Graphical User Interface on the screen. The primary purpose of the Telia WebButler service is, however, to control and monitor the personal agent which operates on a net-based server. This means that the user can initiate processes for the agent through any suitable device available at the time, for example, a home computer, a computer at his/her place of work, a mobile PDA with a cellular connection to the Internet, etc.. This, for example, enables the user to specify a negotiation strategy for the agent, trigger-points when the user will be informed/involved in further decisions etc., and to order the agent to begin the negotiation/bidding. The user can then disconnect himself/herself from the network and the agent will continue the task it is executing on a server, for example, Telia's server, in the network.

When a trigger-point is reached, the agent informs the user by means of the requested media. This could be through a message on the Telia WebButler, for example, complemented with a message on the user's pager, GSM/SMS etc. if the user has identified the trigger-point as urgent. The user can then access his WebButler through any available suitable device, to analyze the received information and give the agent further directions. The user can of course also elect to finish the bidding etc. manually after the agent has completed the routine work necessary to reach this important point in the process.

Figure 6 diagrammatically illustrates the different software modules in the Agent Specific layer implementing, in this case, the WebButler.

The User Interface of Figure 6 implements a user friendly window on the users

screen. It is based on easily understandable icons for processes and events. When the user clicks on the icons, he/she receives more detailed information on current status, collected information etc.. The user can, in addition, easily control the agent's action by specifying trigger-points etc..

The Interaction Plug-Ins of Figure 6 implement the User Interface to different, or improved, agent applications/behaviour. For example, an agent specialized for electronic auctions (negotiation, strategy, etc.) may include an interface towards index agents necessary to obtain information concerning the location of interesting auctions which include specified items, credit reporting service making sure that the auctioneer's operation is run by a solid company etc.. The Interaction Plug-Ins therefore provide basic mechanisms for different kinds of applications/ behaviour.

The Session Manager of Figure 6 implements the management of the processes necessary to perform the requested tasks. This includes creation of the messages necessary to perform the task, interpret received messages, halt the process and notify the owner of the agent if a trigger-point has been met etc.. The logic necessary to perform the requested tasks is, therefore, implemented in the Session Manager module.

The Database of Figure 6 manages all data necessary for operating the Personal Agent Service. This includes specifications of the owner's interests upon which the requested missions are based, messages received and transmitted, status information on the sessions, locally stored addresses to agents/agent sites which have worked well during earlier missions etc.. The database also stores the requested information which the agent collects through the mission in order to be able to present it to the owner as, and when, requested.

The Telia Merchant Assist includes the necessary functionality for providing real-time personalized promotions to visitors to commercial web sites. The mechanisms also support real-time marketing to consumers after a visit to the store.

The Telia InfoBroker Service includes Telia AgentFind, Telia Archive and Telia Auction. Telia MerchantAssist will have an interface to Telia Pay and Telia Distribute.

The InfoBrokerService sells:

- advertisement distribution to interested companies, - the advertisements are attached to the WebButler's Ad-Box when requests are made from AgentFind; and
- market statistics collected by AgentFind when requests are made - this makes it possible for companies to identify product areas frequently requested by WebButlers and to compare the market's ability to satisfy the demand.

Telia Archive stores electronic contracts. Telia Distribute integrates necessary functionality for the delivery services.

The agent based electronic market place to which the present invention relates is based on decentralized services with enhanced value for both the end users and merchants. The basic services are Telia WebButler, Telia AgentFind and Telia MerchantAssist.

This approach enables users to specify purchase requests, or offers for sale, i.e. buy interests, or sell interests, once. It is then possible to visit any merchant supporting the MerchantAssist service to get personal promotions based on the user's unique interests without the need to answer any questions etc. on the merchants web site, since both WebButlers and MerchantAssists submit their buy/sell interests to the AgentFind service. Thus, it is the AgentFind service that helps the user to find which merchants to visit on the web, based on the user's specified interests.

It is also possible for users to contact each other directly through the AgentFind service. AgentFind matches users interests and helps the users' WebButlers to find other WebButlers with matching interests.

The core of AMP is the three services, referred to above, namely, Telia

WebButler, Telia AgentFind and Telia MerchantAssist.

As previously stated, Telia Web Butler is an efficient and convenient tool for end users when selling, or buying, items on the web, Telia MerchantAssist is the Merchant's tool that makes it possible to provide individual promotions based on a users specific interests at the time they visit the merchants web store, and AgentFind is a necessary service for both WebButler and Merchant Assist which facilitates the connection of buyers to sellers. AgentFind acts as a WebBroker, providing an opportunity for Merchants to expose advertisements, to the owner of a WebButler, which relate to the interests submitted to AgentFind.

All three services are, however, necessary in order for the Agentbased Marketplace to work.

The core of the WebButler is the interest editor. This is a dynamic editors.

Depending on the type of item, relevant questions will be presented on the screen requesting mandatory, or optional, parameters specifying the item. This functionality makes it possible for users to specify the items for purchase, or sale. An advantage with this, for the user, is that he/she doesn't need to browse the net forever in order to find sellers/buyers for the specified trade item. Instead, the user finds other users and/or commercial companies with corresponding interests through the AgentFind service.

When the user visits an electronic store on the web, he/she will get promotions automatically for the items specified and doesn't need to waste valuable time to find those items in the merchants store.

The trigger point editor gives the user the ability to specify how far the WebButler will be allowed to act autonomously and when autonomous execution must cease and the control be returned to the user in order to decide how to proceed.

The user may be informed through the WebButler interface or, alternatively, the user may specify other means of notification for urgent trigger points. This could include, for example, notification through pagers, GSM SPS messages etc.



The MessageBox is the area in the WebButler user interface where information is displayed about ongoing missions.

The Advertisement Box is the area in the WebButler user interface where advertisements/banners are displayed. This is a display area on the WebButler that the WebButler operator has an exclusive right to use, similar to the Banner area on search engines like Altavista. The AdBox is filled with new advertisements when the WebButler has accessed the AgentFind Service. The advertisements are related to the specified interests, stored in the WebButler, when accessing AgentFind.

The personal profile provides the possibility for users to store information about name, address, phone/fax numbers, demographic data, long-term interests etc. The user can protect icon. Otherwise, this information, or parts of it, is accessible for merchants and other users of WebButlers. This has the advantage that users don't have to type in all their personal information when purchasing an item. The user will also get a more personalized treatment when visiting merchants stores.

The Book-Marks-to-other-Agents function makes it possible for WebButlers to store addresses to favourite agents, or other WebButlers, or MerchantAssists, which have been received earlier from AgentFind.

The negotiate functionality makes it possible for Web Butlers and MerchantAssists to negotiate during the purchasing phase of an item. If several participants are involved, the negotiation turns into an electronic auction. Users can select different negotiation strategies, based on their own preferences. It is, therefore, impossible for an individual participant to know the outcome of such a negotiation.

Use of a Plug-In API makes it possible for third party vendors to add sell software for users WebButlers giving them enhanced behaviour and/or functionality. This could include, for example, more powerful negotiation algorithms, functionality for a competence broker etc. Providing this open interface ensures a fast growing penetration of WebButlers.

Identification may be performed by the use of passwords. However, when negotiation, electronic contracts etc. are deployed, it is necessary to have a more secure identification of users. This can be achieved by the use of smart card identification with certification of authority functionality.

5 In order to make the purchasing phase more efficient, functionality for supporting electronic contracts can be provided.

10 In order to make the payment phase efficient, functionality for supporting different electronic payment mechanisms can be supported as well as electronic wallets for management of the different means of electronic payment, receipt etc.

Functionality can be provided to make it possible to restrict the usage of WebButlers. This is done by using inheritance mechanisms where a "parent" WebButler 15 can restrict the functionality of "child" WebButlers. For consumers, it could, for example, be that the children in a household will only be able to purchase items that are not related to violence, pornography etc. In a business environment, it could be, for example, that employees can only purchase items related to the company's operation.

20 The primary function of Telia AgentFind is to match sell/buy interests. This is done by managing a database with specified sell/buy interests together with the address to the WebButler, or MerchantAssist, that submitted the interest.

When a WebButler, consumer's agent, or MerchantAssist, merchant's agent, 25 submits an interest specification, it will receive information about WebButlers and MerchantAssists with corresponding interests. For each corresponding interest a message, or diagram, showing the level of correspondence will be received. Based on this information, the WebButlers, or MerchantAssists, can access the other agents with the closest corresponding interests.

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Consumers and Merchants can file specified interests with the AgentFind Service. Consumer A can thus determine that Merchant 1 has a corresponding interest and Consumer D determines that Merchant 3 has the best match for his/her interests.

Consumer B, on the other hand, may find that Consumer C is the best person to contact with regard to his/her specific interests.

The major revenue from the AgentFind Service will probably be made from information brokerage. That is the sale of exposure of advertisements/banners on users WebButlers based on the specific interests submitted to AgentFind. This is achieved by using the AdBox facility on the WebButler for which AgentFind has exclusive access for advertising promotions.

Another source of revenue for AgentFind is the sale of market statistics. That is information regarding the volume and profile of submitted interests. This information is very valuable for merchants, since it enables them to detect mismatches between market demand for specific products and what is currently on offer. This information can for example be used when a merchant would like to expand sales into new product areas etc.

As previously stated, Telia MerchantAssist provides the necessary functionality for realizing realtime personalized promotions to visitors to commercial web-sites, i.e.

MerchantAssist provides merchants with the opportunity to provide individual promotions when users visit a merchants web-store on the Internet. This is done by synchronizing the users specified interests with the items provided by the electronic stores. If the store has matching items, specific individualized promotions can be provided for the specific customer. The potential can be even greater if the store also matches the interests with the users previous purchases in the store, which are stored in the Customer Database.

It is then possible to know if the consumer is an important customer who should receive special treatment.

The MerchantAssist Service makes it possible for the Merchant to make "off-line" promotions for the consumer based on the consumer's specified interests which are valid when the store was visited.

As previously stated, the services provided by AMP include, inter alia, WebButler that makes it easier for user's to take advantage of the offered services, MerchantAssist

that creates new opportunities for real time and relationship marketing for merchants (sellers of the offered services), and InfoBroker/AgentFind that creates valuable opportunities for a network operator, such as Telia, to sell individual advertisements and statistics.

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The WebButler, AgentFind and MerchantAssist services are based on buy/sell interests. These interests are specified by the sellers and buyers. When a buy, or sell, interest is submitted to AgentFind, the buyer, or seller, as the case may be, receives a response from AgentFind containing information concerning who, i.e. a user's WebButler, or merchant's Web Store, has corresponding interests. The response includes a rating of how well the other agent's interests correspond.

As previously stated, in order to successfully operate an agent orientated market place, such as AMP, it is necessary to make it extremely easy for users to specify their buy/sell interests. It is for this reason, that the WebButler service provides scroll-bars with pre-defined information relating to the available product categories, as well as the attributes of the product that a user would like to buy, or sell.

Figure 7 of the accompanying drawings shows a typical scroll-bar specification for buy/sell interests, which WebButler is adapted to provide, together with an example showing how a user selects the product category 'Cars' and those attributes associated with the car the user would like to buy. Each user of an agent orientated market place, such as AMP, has a terminal arranged for connection to the Internet and each user terminal includes a computer having a display screen and the necessary software for accessing the Internet and the agent orientated market place services. In operation, the scroll-bar is displayed on the user's computer screen, and the user selects, in accordance with this example, the Product Category 'Cars', together with those of the displayed attributes in which the user is specifically interested, i.e. the user selects those items of the scroll-bar lists 'Buy/Sell', 'New or Old', 'Age', 'Price' and 'Type of Car', which meets the user's requirements for the car he/she wishes to purchase. The user's selections are shown in bold outline in Figure 7, i.e. for this example, the user is interested in buying a used 1995 to 1997 Mini Van at a price of not less than about 80 kkr. In the window 'Other requirements' of Figure 7, it is possible for the user to include

additional attributes, not included in the scroll-bar specifications, using the keyboard of his/her computer. In the present example, the user has specified that the Mini Van must be metallic blue in colour, and have four wheel drive, winter tyres, and a radio and CD player.

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Whilst the scroll-bar based specifications for product categories and attributes is of importance for user friendliness, it is also of importance for determining whether two identical interests are in fact described in the same way. If this determination cannot be made, it will not be possible for AgentFind to detect correspondence between a buy-interest and a sell-interest.

It is impossible for an operator of an AgentFind Index Service to manually specify all possible product categories and the valid attributes for each product category. Even if a large amount of initial work is done to keep the service up to date, it would still be necessary to create and delete product categories and attributes, over time, due to the fact that new products are entering the market and old products are becoming obsolete.

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The solution, according to the present invention, is the provision of a self regulating system that makes it possible for users to create and delete product categories and attributes when needed. Furthermore, in order to ensure that an efficient and user friendly system is provided, it is necessary for the telecommunications transmission system of the present invention to:

- limit the number of product categories and the number of attributes/product categories to a manageable size for users of the electronic market place;
- automatically remove rarely used product categories and/or attributes; and
- replace the rarely used product categories and/or attributes with the more popular product categories and attributes;

and to thereby facilitate dynamic adaptation of the categories/attributes that are mostly requested by system users.

In order to facilitate easy management of a scroll-bar interface on the screen of a user's computer, in accordance with the present invention, the number of displayed items is limited to, for example, about 20 to 30 items, and statistical information is generated concerning how many times each product category, and the related attributes to each product category, is actually used over a period of time. In practice, the statistical information is updated each time a buy/sell request is submitted to the AgentFind service. Thus, in accordance with the present invention, the most used categories/attributes on the scroll-bar list, can be readily determined using statistical measurements.

In accordance with the present invention, product categories that are rarely used are transferred from the scroll-bar list to a search function for 'Other Product Categories'. See Figures 8 and 9 of the accompanying drawings.

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Figure 8 of the accompanying drawings shows, by way of example, a request to use 'Other Product Categories' which are not displayed on the scroll-bar list, or menu. In this example, the user specifies that he/she would like to find the product category 'Motorcycle' and a search is initiated by the 'Other Product Category' for this product. In other words, a user, wishing to buy a Motorcycle, selects 'Find' in the 'Other Product Categories' list on his/her computer screen, uses the keyboard of his/her computer to type the product category 'Motorcycle' in the space provided and then clicks to 'Search' icon on the computer screen. A search is then undertaken for this product category and, if successful, scroll-bar lists for the selected product category/attributes are displayed on the user's computer screen, as shown in Figure 9 of the accompanying drawings. It will be seen from the highlighted sections of Figure 9 that the user wishes to buy a used, pre-1986 (old), HD Motorcycle at a price of not less than about 80 kkr. If a search for a suitable product in 'Other Product Categories' is unsuccessful, it is possible, according to the present invention, for a system user to define his/her own specification for a new product category/attributes. An example of this feature of the present invention is shown in Figure 10 of the accompanying drawings.

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In accordance with this example, the user uses the keyboard of his/her computer to type (define) the name of the new product, 'Exercise Equipment', in the space provided in the 'New Product Category' window on the computer screen. The attributes 'Buy/Sell', 'New or Used', 'Age', 'Price' and 'Location' are mandatory and are automatically included for every new product category defined by a user. The user only needs to define, in the space provided, the specific "Type Of" attributes for the new product, using the keyboard of his/her computer. As shown in Figure 10, the required attributes specified for this example are as follows:

10                    -        General Fitness System;

                                 Bike;

                                 Stepper; and

15

                                 Rowing.

                                 If the user wishes to further specify some or all of the "Type Of" attributes for the 'Exercise Equipment', it is possible to add layer on layer of more detailed definitions for each type of new product category. These attributes are then presented as new scroll-bars in a nested structure:

                                 In order to further simplify use of the system and to secure a consistent information infrastructure, 'inheritance' is used. The manner in which this is effected will now be outlined. When a user wishes to add a new product category and/or attribute, the system displays the attributes that could be 'inherited' by the new product, from a higher level in the information topology. The user can then select the attributes, which he/she would like to include for the new product, from the displayed list, as a default function beside the already presented functionality for specifying new types of attributes.

30                    It will be seen from the subsequent description that the present invention is adapted to effect automatic removal of illegal and/or unethical product categories/attributes. In practice, an operator of the agent orientated market place

services is notified when a new product category, or attribute, is defined. If the new product category is considered to be unethical, or illegal, i.e. illegal drugs, pornography etc., the operator removes the new category from the system. If a new category has been removed in this manner, the related information is stored in a 'black list' of non-accepted product categories and attributes. When a new product category/attribute is defined by a user, an automatic check is made against the 'black-list'. If the new product category/attribute is found on the black list, the request for the new product category/attribute is automatically rejected. This function makes it relatively easy for the operator to ensure that unethical/illegal products are not made available in the electronic market place, i.e. the operator can ensure, through use of the notification procedure and the black list, that it is not possible to buy/sell such products through the AMP services.

The present invention is also adapted to remove duplicate categories/attributes from the system through use of the received notifications relating to newly defined product categories and/or attribute. In other words, duplication of product categories/attributes is avoided by comparing newly notified product categories/attributes with the product categories/attributes which have already been defined. This function enables the operator to 'clean-up' the information structure either automatically, or when it is convenient for the operator.

The manner in which new categories/attributes are placed in 'Other Product Category' and made available by the search function will now be described.

When a new product category has been defined by the user, the present invention is adapted to automatically generate a scroll-bar presentation for the new product category. The new product category is then made available in 'Other Product Category' through the search function.

The present invention provides a similar functionality for the case when a user wishes to add attributes to an already defined product category. If, through use of this functionality, the number of attributes exceeds a predefined limit (i.e. based on user friendliness - see above), for example, 20 attributes on each scroll-bar level, the additional attributes, i.e. in excess of the predefined limit, can be found through either a



search function, or by an expansion function that displays the additional attributes in at least one further set.

The present invention provides an enhanced algorithm for selection of the product categories/attributes for scroll-bar presentation. In order to ensure that the most commonly used product categories and attributes are presented on the scroll-bar menus, an algorithm is used to calculate which categories are:

retained on the product category scroll-bar list;

moved to the search function for Other Product Category; or

moved from 'Other Product Category' to the product category scroll-bar menu.

The usage statistics for each product category/attribute are continuously measured and the operator of the service defines the time interval at which the statistical information is calculated and the product categories are restructured. Default value could, for example, one week, or between 7 to 10 days.

Use of the scroll-bar menus will, in practice, be much greater than use of the search function for 'Other Product Category' because the scroll-bar menus have a more convenient user interface. This makes it possible for a system operator to transfer a predefined percentage of product categories from the scroll-bar menus to 'Other Product Categories'. This can be done even if the product category on the scroll-bar menu is used more frequently than is the case for the product category in 'Other Product Category' that replaces it on the scroll-bar menus. The main reason for doing this is to give new product categories a fair chance to become established on the scroll-bar list/menus.

Product Category	Access/Week	Product Category	Access/Week
Scroll-Bar Menu		Other Product Category	
Games	32798	Pets & Animals	8743
Apartment	17924	Insurance	2173
Cars	13749	Consulting Services	1112
Computers	9732	Education	782
Bicycles	8742	Garden	782
Music	4873	Clothes & Fashion	312
Concerts	3416	Healthcare	311
Travel	3191	Jewelry	241
Furniture	2173	Food	131
Boats	2173	Copy Machines	72
Literature	1318	Stamps	12
		Stocks	5

The above table shows, by way of example, how many accesses per week may typically be made for product categories on the 'Scroll-Bar Menu' and the 'Other Product Category'. On the basis of these statistics, the enhanced algorithm of the present invention will automatically move:

- the categories for 'Boats' and 'Literature' from the 'Scroll-Bar Menu' to the 'Other Product Category'; and
- the categories for 'Pets & Animals' and 'Insurance' from the 'Other Product Category, to the 'Scroll-Bar Menu'.

In addition, if the operator of the service decides to replace, say 27% of the

product categories on the 'Scroll-Bar Menu', each week (or 7 to 10 days), in order to stimulate new product categories, then, on the basis of the statistical information given above, the product category 'Furniture' will also be moved to the 'Other Product Category' and be replaced by 'Consultancy Services'. In other words, the enhanced algorithm of the present invention will automatically select and transfer a total of three product categories (27%), with the lowest 'Access/Week' statistics, from the 'Scroll-Bar Menu' to the 'Other Product Category', and replace them on the Scroll-Bar Menu with the three product categories on the 'Other Product Category' having the highest 'Access/Week' statistics.

It will be seen from the foregoing description that the present invention, which can be used to provide agent-based electronic market place services, such as the AMP services offered by Telia, has a number of advantages, in comparison to known systems, in that it is adapted to:

employ user specified interests;

- gives a more accurate match of buyer/seller interests in an agent-based electronic market place, such as AMP;

- provide a self-converging function that makes it possible for users to generate information to scroll-bar menus and ensure that only the most valuable/used information is displayed on the scroll-bars; and

25 - provide a user friendly environment for electronic market place trading due, at least in part, to on-screen use of relatively short scroll-bar menus.

Furthermore, since management of buy/sell interests is a basic prerequisite for commercially viable agent-based electronic market places, such as AMP, the functionality provided by present invention is of very important for the establishment of such a market place for network operators, such as Telia.

As herein used, the terms WebButler and MerchantAssist are intended to refer to

agents associated with end users, or consumers, and merchants respectively, and should not be interpreted as carrying any connotation limiting them to a particular service provider, such as Telia.

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**CLAIMS**

1. A telecommunications transmission system adapted to operate as a platform for  
5 an agent-based electronic market and including a plurality of end user terminals  
arranged for connection to the Internet, at least one service provider server, and a  
plurality of electronic shops, said platform being arranged to support agent-based  
market interactions between a plurality of agent types, characterised in that said system  
includes means for automatically creating and managing product categories/attributes  
10 for said electronic market place and facilitating self regulation of the system.

2. A telecommunications transmission system, as claimed in claim 1, characterised  
in that services provided by said agent-based electronic market place include, inter alia,  
WebButler, AgentFind and MerchantAssist services, based on buy/sell interests  
15 specified by buyers and merchants, in that said WebButler and said MerchantAssist  
services are adapted to carry specifications of interest in trade terms, and in that said  
AgentFind service is adapted, in response to receipt of a specification for a buy/sell  
interest, to identify a WebButler, or Web-store, having a specification for a  
corresponding interest.

3. A telecommunications transmission system, as claimed in claim 2, characterised  
in that said WebButler service including means for generating scroll-bar menus  
containing information relating to categories and attributes of products that are available  
for purchase, or sale, via said agent-based electronic market place, in that said end user  
25 terminals include a computer having a display screen and software for accessing the  
Internet and said agent-based electronic market place, and in that said scroll-bars are  
adapted to be displayed on the display screen of said user's computer.

4. A telecommunications transmission system, as claimed in claim 3, characterised  
30 in that said WebButler is adapted to provide the following scroll-bar menus:

- Product Category;

- **Buy/Sell;**

- **New or Used;**

5 - **Age;**

- **Price; and**

- **Type of Product selected from a 'Product Category' menu.**

10

5. A telecommunications transmission system, as claimed in claim 3, or claim 4, characterised in that said system is adapted to:

- **employ user-specified interests;**

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- **match buyer/seller interests; and**

- **provide a self-converging functionality that enables:**

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**system users to generate information for scroll-bar menus; and**

**system operators to ensure that product categories displayed on said scroll-bar menus are the most frequently used/valuable categories.**

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6. A telecommunications transmission system, as claimed in claim 4, or claim 5, characterised in that said system is adapted to display, on the screen of a user's computer, scroll-bar menus for product categories/attributes, together with an 'Other Requirements' window, adapted to enable said user to specify product attributes, not included in said scroll-bar menus.

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7. A telecommunications transmission system, as claimed in any preceding claim, characterised in that said self regulating system is adapted to enable a user to create and delete product categories.

8. A telecommunications transmission system, as claimed in any of claims 3 to 7, characterised in that said self regulated system is adapted to facilitate dynamic regulation of the form and content of said scroll-bar menus by:

- limiting said scroll-bar menus to a predefined number of product categories and product attributes;
- automatically and selectively removing, from said scroll-bar menus, those product categories and/or attributes that are least used; and
- automatically replacing the removed product categories/attributes with other product categories/attributes.

9. A telecommunications transmission system, as claimed in claim 8, characterised in that said system is adapted to provide a user friendly and relatively easy to manage scroll-bar interface by limiting the number of product categories and product attributes to about 20 to 30 items per scroll-bar menu.

10. A telecommunications transmission system, as claimed in claim 9, characterised in that said system is adapted to automatically generate, over a predetermined period of time, statistical information concerning the frequency of use of each product category and the related attributes and to thereby determine the most frequently used product categories/attributes.

11. A telecommunications transmission system, as claimed in claim 10, characterised in that said system is adapted to automatically transfer rarely used product categories from a respective scroll-bar menu to a search function for 'Other Product Categories', and in that said search function is adapted to find product categories not displayed on said scroll-bar menus.

12. A telecommunications transmission system, as claimed in claim 11, characterised in that said search function for 'Other Product Categories' is adapted to be

displayed on said user's computer screen, and in that said display includes:

- an 'Other Product Category' window including a 'Find' icon and a 'Specify New' icon, each icon being adapted for selection by a system user; and
- a further window including a search icon, and a legend requesting said user to write the name of a required product category in a space provided in said further window, said search icon being adapted for selection by said user after entering said product category name in the provided space.

13. A telecommunications transmission system, as claimed in claim 12, characterised in that, in the event of an unsuccessful search with said search function for 'Other Product Categories', said system is adapted to enable a new product category and product attributes to be defined by a user, and to automatically specify, for said new product category, attributes that are mandated by said system.

14. A telecommunications transmission system, as claimed in claim 13, characterised in that the attributes mandated by said system are 'Buy/Sell', 'New or Used', 'Age', 'Price', and 'Location'.

15. A telecommunications transmission system, as claimed in claim 13, or claim 14, characterised in that said system is adapted to:

display attributes, from an information topology of said system, that could be inherited by said new product category;

enable said user to select any one, or more, of the displayed attributes for the new product category; and

- enable selected attributes to be displayed, as a default function, beside an already presented functionality for specifying new types of attributes.

16. A telecommunications transmission system, as claimed in any preceding claim,



characterised in that said system includes notification means for notifying the system operator when a new product category, or product attributes, are defined.

17. A telecommunications transmission system, as claimed in claim 16,  
5 characterised in that said system is adapted to:

effect automatic removal of, or prevent entry of, illegal and/or unethical product categories/attributes;

10 - store removed product categories/attributes on a 'black list';

automatically check newly defined product categories, notified by said notification means, with said black list; and

15 - automatically reject new product categories/attributes found on said black list.

18. A telecommunications transmission system, as claimed in claim 16, or claim 17,  
characterised in that said system includes means for automatically removing duplicate  
product categories.

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19. A telecommunications transmission system, as claimed in any of claims 16 to 18,  
when appended to any of claims 11 to 15, characterised in that said system includes  
means for automatically generating scroll-bar menus for a new product category and to  
make said new product category available in said 'Other Product Category' through use  
25 of said search function.

20. A telecommunications transmission system, as claimed in any of claims 16 to 19,  
characterised in that said system is adapted to:

30 - enable a user to add attributes to an already defined product category;

- automatically limit the number of attributes for a product category to a pre-defined limit; and

ensure that any attributes, in excess of the predefined limit, are made available through either a search function, or by an expansion function for displaying the attributes in at least one further set.

21. A telecommunications transmission system, as claimed in any preceding claim, characterised in that said system includes an algorithm adapted to select product categories/attributes and to calculate which categories are:

retained on a product category scroll-bar list; or  
 moved to the search function for 'Other Product Category'; or  
 moved from 'Other Product Category' to a product category scroll-bar menu.

22. A telecommunications transmission system, as claimed in claim 21, characterised in that said algorithm is adapted to continuously calculate and generate statistical information concerning usage for each product category/attribute, the time interval at which said statistical information is calculated and said product categories are restructured, using said statistical information, being set by an operator of said system.

23. A telecommunications transmission system, as claimed in claim 22, characterised in that a default value for said time interval is one week.

24. A telecommunications transmission system, as claimed in any of claims 21 to 23, characterised in that said system includes means for automatically transferring a predefined percentage of product categories from a scroll-bar menu to 'Other Product Categories', at predetermined time intervals, and for replacing the transferred product categories with product categories from said 'Other Product Categories'.

25. A telecommunications transmission system, as claimed in any of claims 22 to 24, characterised in that said predefined time limit is every 7 to 10 days.

26 In a telecommunications transmission system adapted to operate as a platform for an agent-based electronic market and including a plurality of end user terminals arranged for connection to the Internet, at least one service provider server, and a plurality of electronic shops, said platform being arranged to support agent-based market interactions between a plurality of agent types, a method of operating the telecommunications transmission system characterised by automatically creating and managing product categories/attributes for said electronic market place and facilitating self regulation of the system.

27. A method, as claimed in claim 26, characterised by said agent-based electronic market place providing a number of services include, inter alia, WebButler, AgentFind and MerchantAssist services, based on buy/sell interests specified by buyers and merchants, by said WebButler and said MerchantAssist services carrying specifications of interest in trade terms, and by said AgentFind service, in response to receipt of a specification for a buy/sell interest, identifying a WebButler, or Web-store, having a specification for a corresponding interest.

28. A method, as claimed in claim 27, characterised by said WebButler service providing scroll-bar menus containing information relating to categories and attributes of products that are available for purchase, or sale, via said agent-based electronic market place, by said end user terminals including a computer having a display screen and software for accessing the Internet and said agent-based electronic market place, and by said scroll-bars being displayed on the display screen of said user's computer.

29. A method, as claimed in claim 28, characterised by said WebButler providing the following scroll-bar menus:

**Product Category;**

**Buy/Sell;**

**New or Used;**

- Age;

- Price; and

5 - Type of Product selected from a 'Product Category' menu;

30. A method, as claimed in claim 28, or claim 29, characterised by the steps of:

- employing user-specified interests;

- matching buyer/seller interests; and  
 providing a self-converging functionality that enables:

15 - system users to generate information for scroll-bar menus; and  
 system operators to ensure that product categories displayed on said  
 scroll-bar menus are the most frequently used/valuable categories.

20 31. A method, as claimed in claim 29, or claim 30, characterised by the steps of:  
 displaying, on the screen of a user's computer, scroll-bar menus for product  
 categories/attributes, together with an 'Other Requirements' window;

25 - said user using said scroll-bar menus to specify product attributes, not included  
 in said scroll-bar menus.

30 32. A method, as claimed in any of claims 26 to 31, characterised by said self  
 regulating system enabling a user to create and delete product categories.

33. A method, as claimed in any of claims 29 to 32, characterised by said self  
 regulated system facilitating dynamic regulation of the form and content of said scroll-bar  
 menus by:

- limiting said scroll-bar menus to a predefined number of product categories and product attributes;

5 - automatically and selectively removing, from said scroll-bar menus, those product categories and/or attributes that are least used; and

- automatically replacing the removed product categories/attributes with other product categories/attributes.

10

34. A method, as claimed in claim 33, characterised by limiting the number of product categories and product attributes to about 20 to 30 items per scroll-bar menu to facilitate the provision of a user friendly and relatively easy to manage scroll-bar interface for said system.

15

35. A method, as claimed in claim 34, characterised by automatically generate, over a predetermined period of time, statistical information concerning the frequency of use of each product category and the related attributes, and by determining the most frequently used product categories/attributes.

20

36. A method, as claimed in claim 35, characterised by automatically transferring rarely used product categories from a respective scroll-bar menu to a search function for 'Other Product Categories', and by using said search function to find product categories not displayed on said scroll-bar menus.

25

37. A method, as claimed in claim 36, characterised by the steps of:

displaying said search function for 'Other Product Categories' on said user's computer screen, said display including:

30

an 'Other Product Category' window having a 'Find' icon and a 'Specify New' icon associated therewith; and

- a further window having a search icon associated therewith, and a legend requesting said user to write the name of a required product category in a space provided in said further window;
- 5 - a system user initiating a search for a product category not displayed on said scroll-bar menus by:
  - clicking said 'Find' icon;
  - 10 - writing the name of the required product in the space provided for that purpose; and
  - clicking said search icon; and
  - 15 - a system user defining a new product category by clicking said 'Specify New' icon to reveal further windows for specifying the name and attributes of the new product.
- 38. A method, as claimed in claim 37, characterised by the steps of:
  - 20 - said system user, in the event of an unsuccessful search with said search function for 'Other Product Categories', defining a new product category and product attributes; and
  - 25 - said system automatically specifying, for said new product category, attributes that are mandated by the system.
- 39. A method, as claimed in claim 37, characterised in that the attributes mandated by said system are 'Buy/Sell', 'New or Used', 'Age', 'Price', and 'Location'.
- 40. A method, as claimed in claim 36, or claim 37, characterised by the steps of:
  - said system displaying attributes, from an information topology thereof, that

- could be inherited by said new product category;
- said user selecting any one, or more, of the displayed attributes for the new product category; and
- 5 displaying selected attributes for said new product category, as a default function, beside an already presented functionality for specifying new types of attributes.
- 10 41. A method, as claimed in any of claims 26 to 40, characterised by notifying the system operator when a new product category, or product attributes, are defined.
- 42 A method, as claimed in claim 41, characterised by the steps of:
- 15 effecting automatic removal of, or preventing entry of, illegal and/or unethical product categories/attributes;
- storing removed product categories/attributes on a 'black list';
- 20 automatically checking newly defined product categories, notified to said system operator, with said black list; and
- automatically rejecting new product categories/attributes found on said black list.
- 25 43. A method, as claimed in claim 41, or claim 42, characterised by the step of automatically removing duplicate product categories.
- 44 A method, as claimed in any of claims 41 to 43, when appended to any of claims 36 to 40, characterised by the steps of:
- 30 automatically generating scroll-bar menus for a new product category; and
- making said new product category available in said 'Other Product Category'

through use of said search function.

45. A method, as claimed in any of claims 41 to 44, characterised by the steps of:

- 5 - enabling a user to add attributes to an already defined product category;
- automatically limiting the number of attributes for a product category to a pre-defined limit; and
- 10 - ensuring that any attributes, in excess of the predefined limit, are made available through either a search function, or by an expansion function for displaying the attributes in at least one further set.

46. A method, as claimed in any of claims 26 to 45, characterised by the step of  
15 using an algorithm for selecting product categories/attributes, and calculating which categories are:

- retained on a product category scroll-bar list;
- 20 - moved to the search function for 'Other Product Category'; or
- moved from 'Other Product Category' to a product category scroll-bar menu.

47. A method, as claimed in claim 46, characterised by the steps of:

- 25 - using said algorithm to continuously calculate and generate statistical information concerning usage for each product category/attribute; and
- an operator of said system setting the time interval at which:
- 30 - said statistical information is calculated; and
- said product categories are restructured using said statistical information.



48. A method, as claimed in claim 47, characterised in that a default value for said time interval is one week.

49. A method, as claimed in any of claims 46 to 48, characterised by the steps of:

- automatically transferring a predefined percentage of product categories from a scroll-bar menu to 'Other Product Categories', at predetermined time intervals; and

- replacing the transferred product categories with product categories from said 'Other Product Categories'.

50. A method, as claimed in any of claims 47 to 49, characterised in that said predefined time limit is every 7 to 10 days.

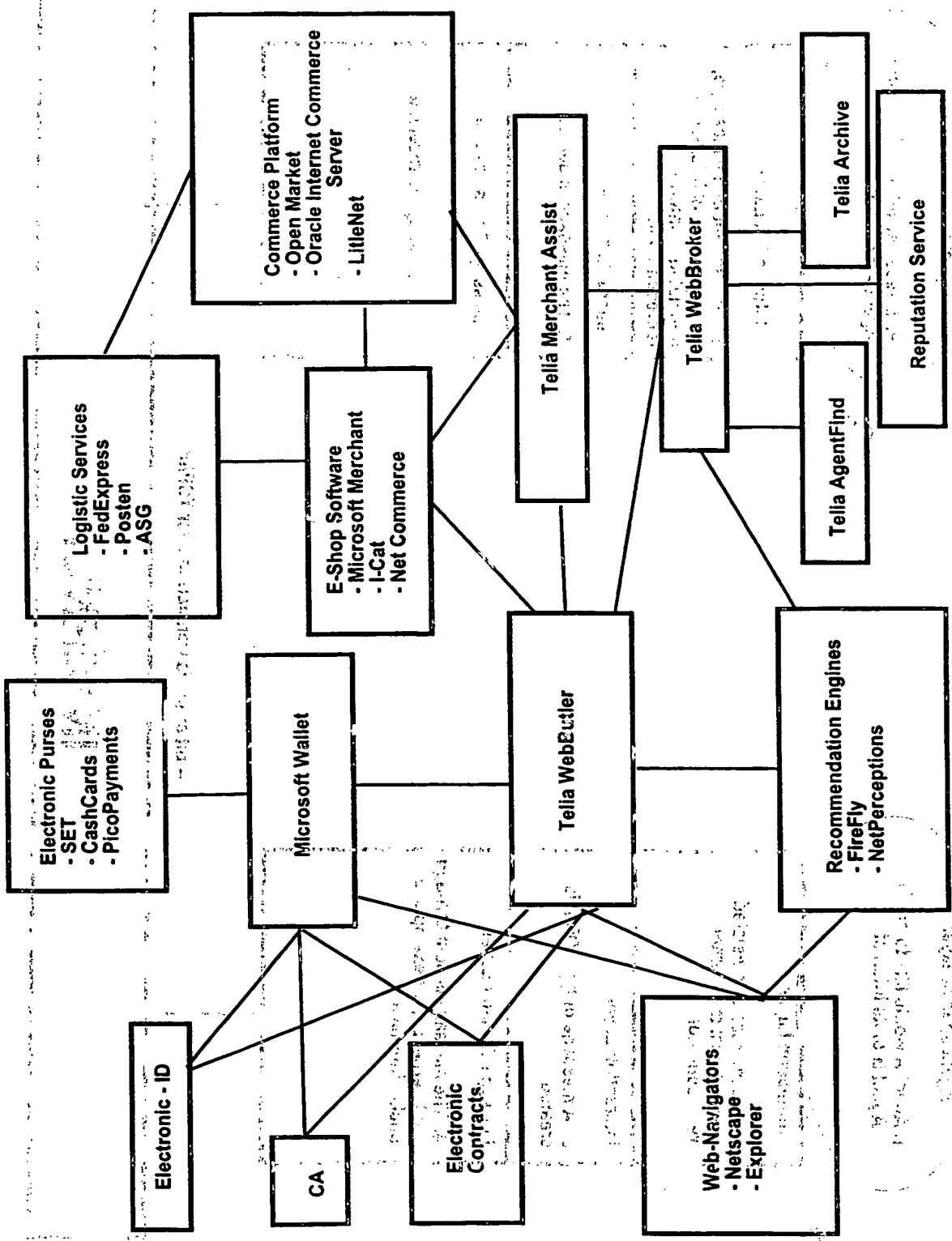


FIGURE 1

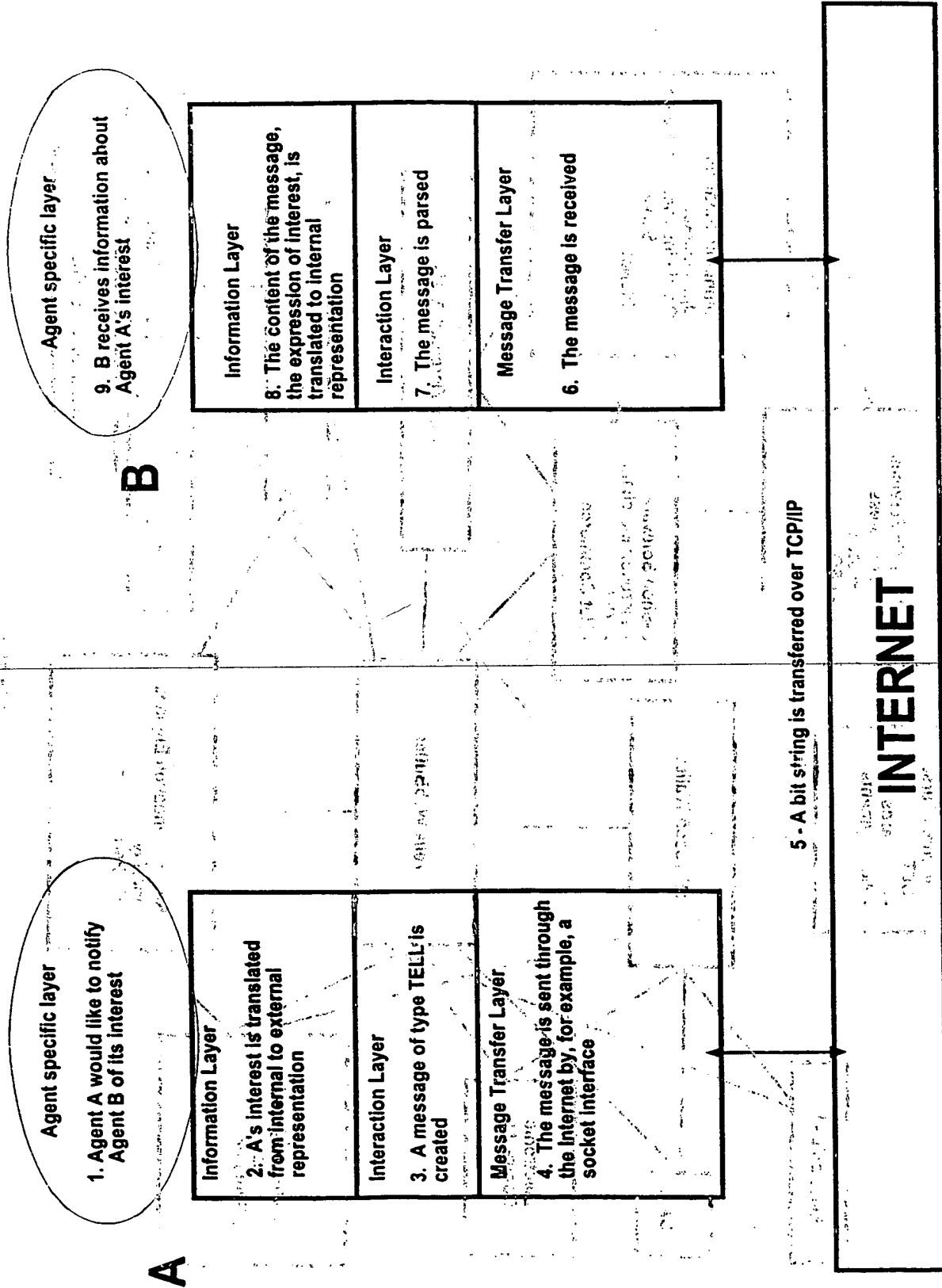


FIGURE 2

RECEIVED MESSAGE EVENT	BEHAVIOUR OF AUCTIONEER
Ask (A, Auct, EOI)	A buy/sell request to A with a specification of the item/interest
Tell (A, Auct, EOI)	A proposal from A to buy/sell with a specification of the item/interest
Negotiate (A, Auct, EOI)	If EOI (Expression Of Interest) indicates that A is interested in buying what the Auct (Auctioneer) is selling, the last offer is sent to A in an Offer message. If there is no offer, the initial request is sent to A in a Negotiate message. A is then a participant in the auction and will receive information about given offers from other participants.
Offer(A, Auct, EOI)	If EOI corresponds to a new highest offer for the item on sale, this offer is distributed in Offer messages to all participants in the auction. In another case, the highest offer is sent back to A. If this was the first offer from A, A is included as a member in the auction. (The Offer message is legally binding, which is not the case for the negotiate message)
Accept (A, Auct)	A is informed by the auctioneer that his/her offer is accepted and the auction of the item is finished.
Deadline (A, Auct)	If this message is sent from the Auctioneer, A is informed that the auction is finished and that somebody else purchased the item. If the same message is sent from A, the Auctioneer is informed that A is no longer interested in participating in the auction. A will not receive new offers.
Timeout (time)	The auction expires when the Timeout message is received. The auction could either be operated during a specified time period, or the auction could end when the time period between two offers is longer than a specified time interval.

FIGURE 3

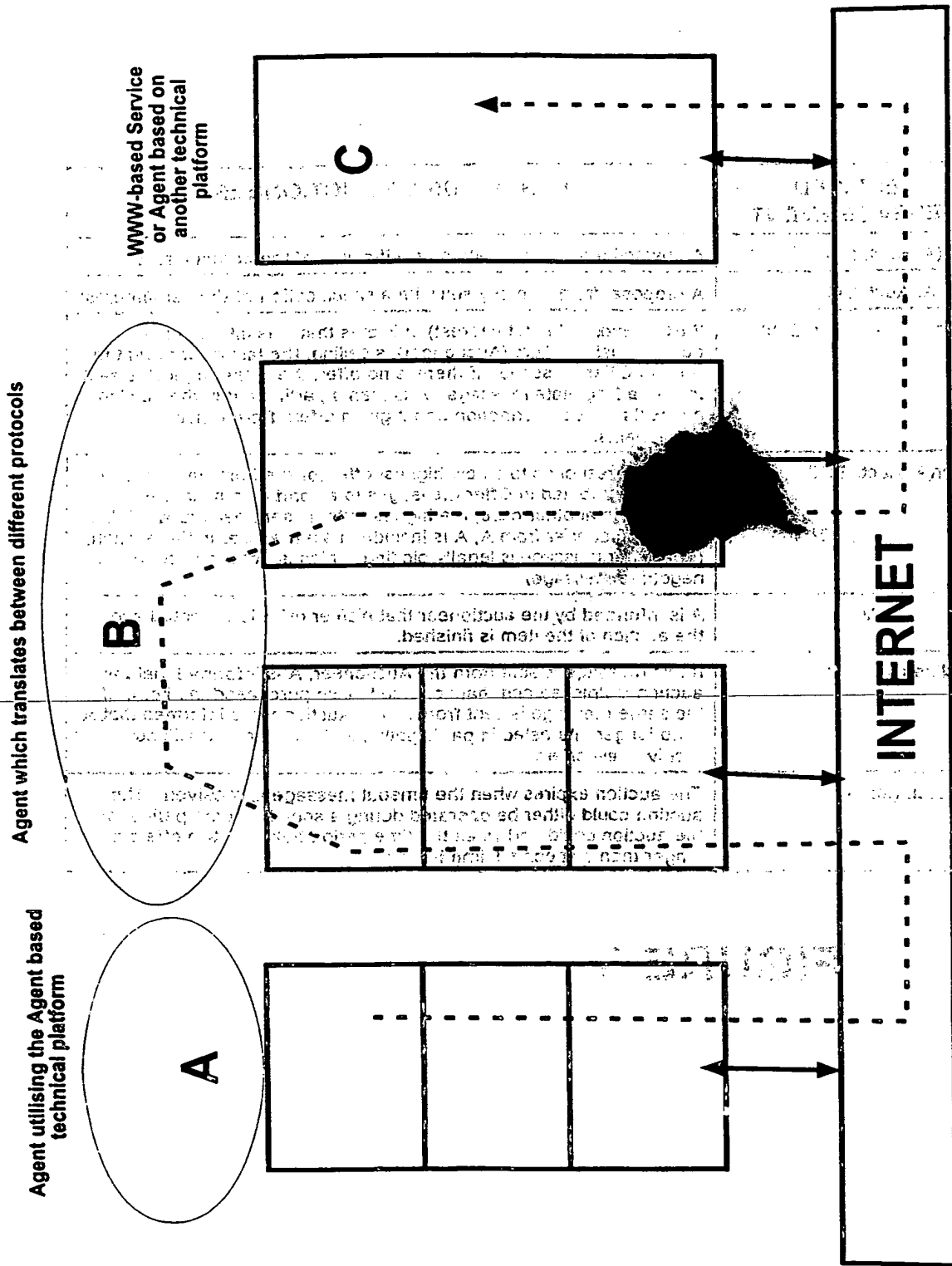


FIGURE 4

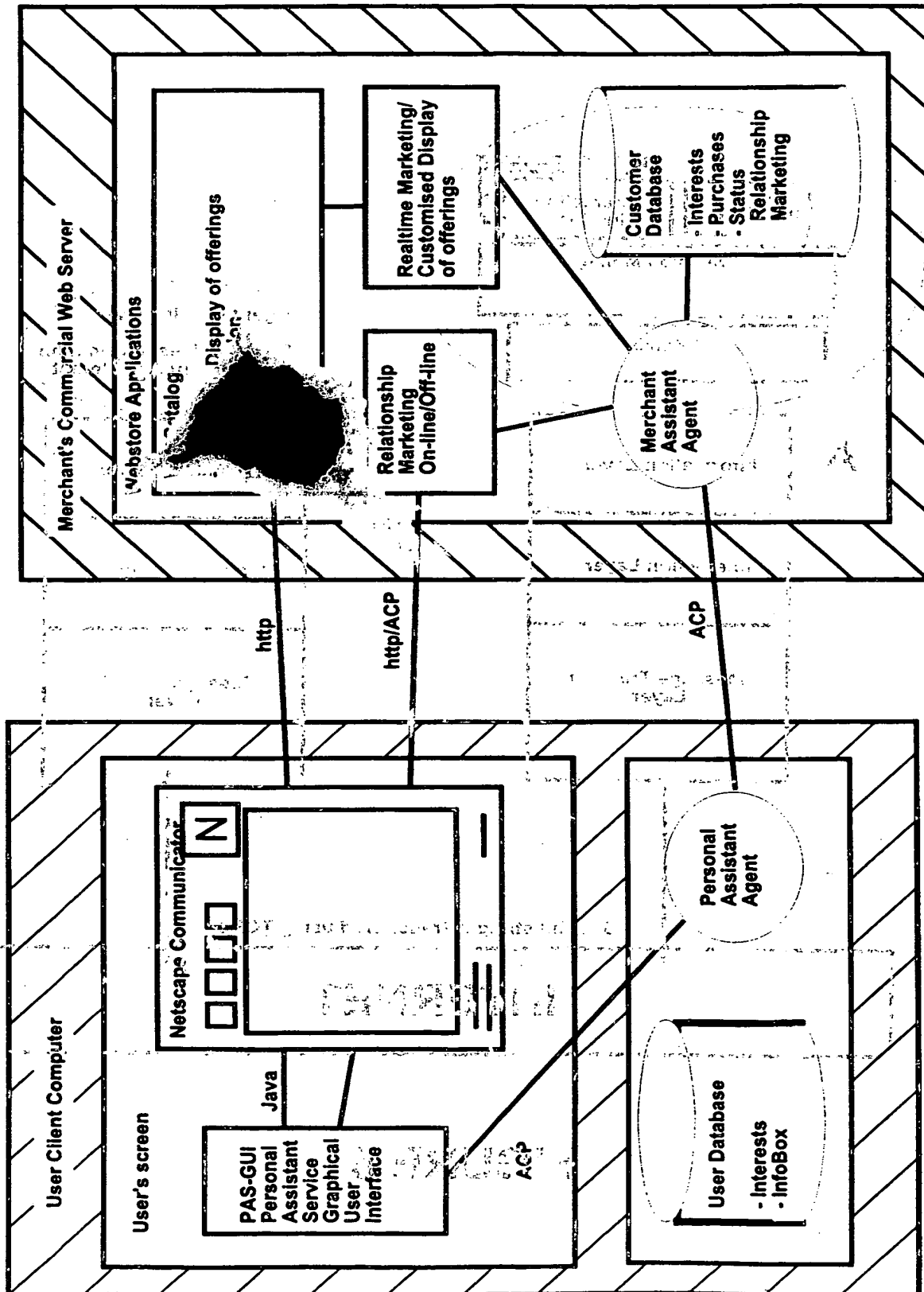
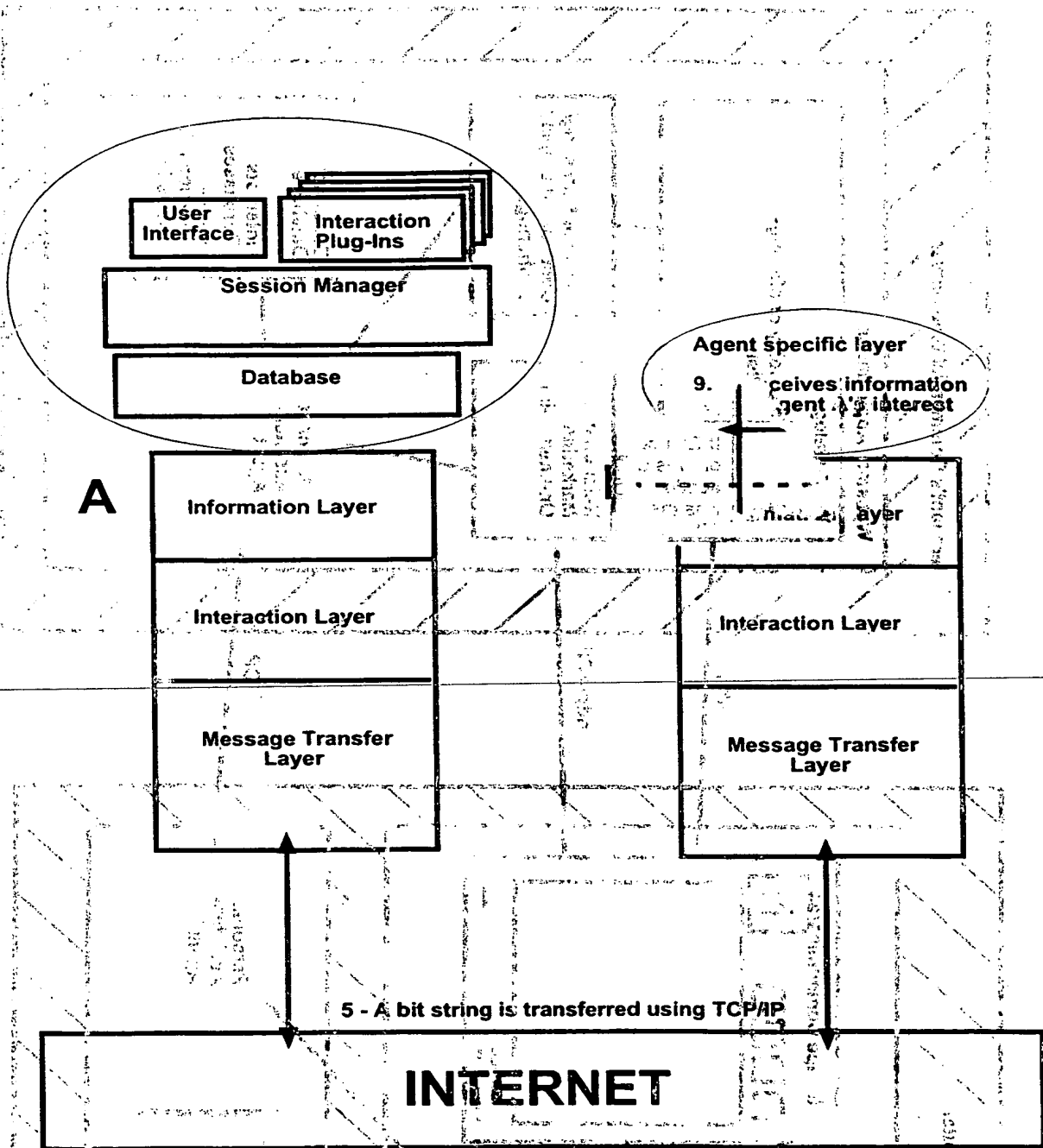


FIGURE 5

**FIGURE 6**

<b>Product Category</b>
Apartment
Bicycles
Boats
Cars
Computers
Conserts
Furniture
Games
Literature
Music
Travel

<b>Buy/Sell</b>
Buy
Sell

<b>New or Used</b>
New
Used

<b>Age</b>
1998
1997
1996
1995
1994
1993
1992
1991
1990
1989
1988
1987
1986
Older

<b>Price (kkr)</b>
> 150
141-150
131-140
121-130
111-120
101-110
91-100
81-90
71-80
61-70
51-60
< 50

<b>Type of Car</b>
Cabriolet
Full Size Van
Luxury
Mini Van
Pick-up
Sedan
Sport

<b>Other Requirements</b>
Four wheel drive, Blue Metallic, Winter Tyres, Radio and CD Player .....

FIGURE 7

<b>Other Product Categories</b>
Find
Specify New

<b>Write the name of the requested product category. Click on the Search Icon when you are finished.</b>
Motorcycle .....
<b>Search</b>

FIGURE 8



Motorcycle	Buy/Sell	New or Used	Age	Price (kkr)	Type of	
	Buy					New
	Sell					Used
			1998			
			1997			
			1996	> 150	City Bike	
			1995	141-150	HD	
			1994	131-140	Cross	
			1993	121-130	Gold Wing	
			1992	111-120		
			1991	101-110		
			1990	91-100		
			1989	81-90		
			1988	71-80		
			1987	61-70		
			1986	51-60		
			Older	< 50		

## FIGURE 9

**New Product Category**

**Exercise Equipment**

Define the possible 'Type of attributes for the new product category. Click on the 'OK' icon when you are finished:

**General Fitness System** .....

**Bike** .....

**Stepper** .....

**Rowing** .....

.....

.....

**OK**

**FIGURE 10**

FIGURE 10



100-100000-100000

100

100

100-100000-100000

100-100000-100000

100-100000-100000

100-100000-100000

100-100000-100000

100-100000-100000

100-100000-100000

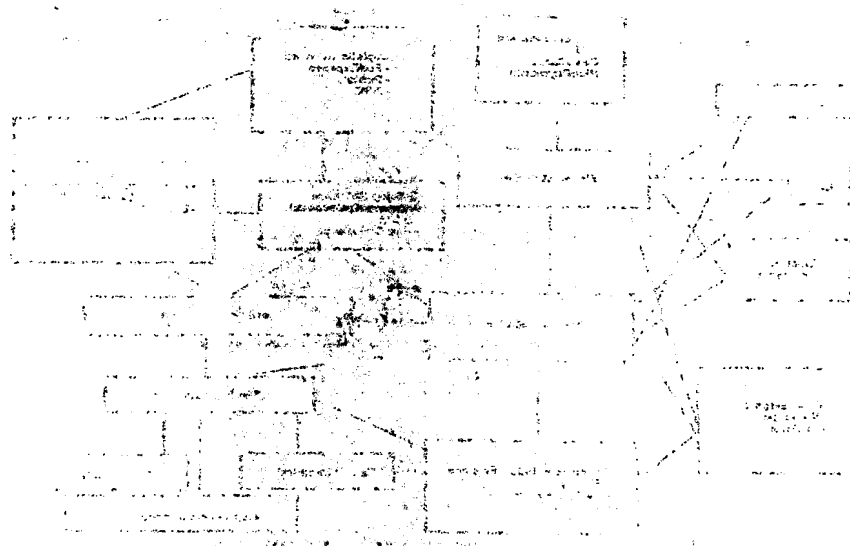
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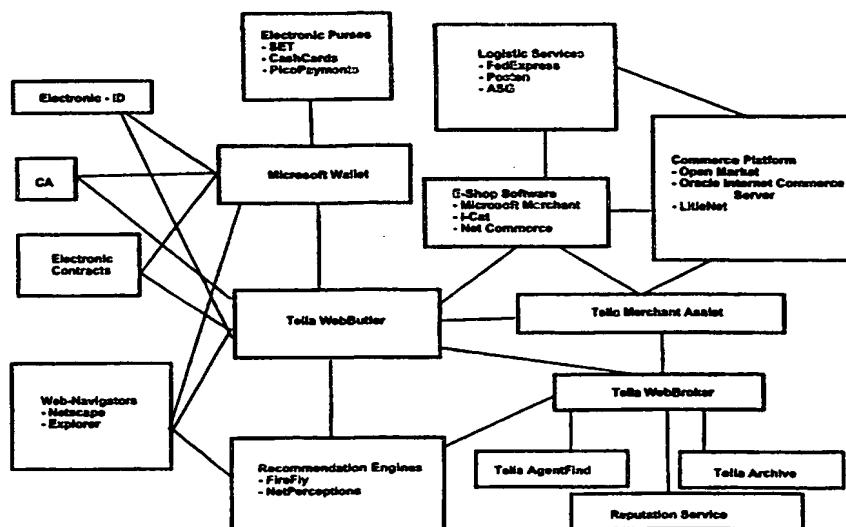
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(74) Agent: PRAGSTEN, Rolf; Telia Research AB, Corporate Patent Dept., Vitsandsgatan 9, S-123 86 Farsta (SE).			

(54) Title: TELECOMMUNICATION TRANSMISSION SYSTEM ADAPTED TO PROVIDE A PLATFORM FOR AGENT ORIENTED ELECTRONIC MARKET PLACE SERVICES



## (57) Abstract

The invention provides a telecommunications transmission system adapted to operate as a platform for an agent-based electronic market. The platform is arranged to support agent-based market interactions between a plurality of agent types. The system includes a plurality of end user terminals arranged for connection to the Internet, at least one service provider server, a plurality of electronic shops and means for automatically creating and managing product categories/attributes for the electronic market place and facilitating self regulation of the system.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/00519

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G06F 17/60, G06F 17/30

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 9726612 A1 (PERSONAL AGENTS, INC.), 24 July 1997 (24.07.97), page 27, line 4; page 34, line 24; page 38, line 13 - line 26, page 1-5, line 36; page 34, line 25; figure 1,2,4a,4c,4d,40	1-50
Y	PAAM 96 Proceedings of the First International Conf...., Volume, April 1996, (London), Anthony Chavez, "Kasbah: An Agent Marketplace for Buying and Selling Goods", page 81, line 26 - line 30, see whole document	1-50
A	WO 9741673 A2 (FREEDOM OF INFORMATION, INC.), 6 November 1997 (06.11.97), page 75, line 10 - line 15	1-50

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A	Uppsala Master's Theses in Computing Science ..., Volume, February, 1997, (Uppsala SWEDEN), Joakim Eriksson et al, "MarketSpace: an open agent-based market infrastructure"	1-50
T,X	WO 9924928 A2 (SHEAR, VICTOR, H), 20 May 1999 (20.05.99)	1-50

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28/09/99

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